

CLAIMS

1. An apparatus, comprising:  
one of a pool and a spa to contain a liquid; and  
at least one light source, supported by the one of the pool and the spa, to  
illuminate the liquid, the at least one light source including at least one LED.
2. The apparatus of claim 1, wherein:  
the one of the pool and the spa includes at least one wall; and  
the at least one light source is supported by the at least one wall.
3. The apparatus of claim 1, wherein:  
the one of the pool and the spa includes a floor; and  
the at least one light source is supported by the floor.
4. The apparatus of claim 1, wherein the one of the pool and the spa has a range of  
typical liquid levels of the liquid during use, and wherein the at least one light source  
is disposed below the range of typical liquid levels.
5. The apparatus of claim 1, wherein the at least one light source is adapted to be  
submersible in the liquid.
6. The apparatus of claim 5, wherein the at least one light source includes at least  
one waterproof surface.
7. The apparatus of claim 1, wherein the at least one light source is adapted to  
generate radiation of different colors without requiring the use of a color filter.
8. The apparatus of claim 1, wherein the at least one LED includes at least two  
differently colored LEDs.
9. The apparatus of claim 1, wherein the at least one LED includes at least one red  
LED, at least one green LED, and at least one blue LED.

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FIG. 10

10. The apparatus of claim 1, wherein the at least one LED includes at least two independently controllable LEDs.

11. The apparatus of claim 1, wherein the at least one light source includes at least  
5 two independently controllable light sources.

12. The apparatus of claim 11, wherein the at least two independently controllable light sources include at least two independently addressable light sources.

10 13. The apparatus of claim 1, wherein the at least one light source is adapted to generate a remotely controllable variable radiation output.

14. The apparatus of claim 1, further comprising at least one controller, coupled to the at least one light source, to control radiation output by the at least one light  
15 source.

15. The apparatus of claim 14, wherein the at least one controller is adapted to control a color of the radiation output by the at least one light source.

20 16. The apparatus of claim 14, wherein the at least one controller is adapted to control an intensity of the radiation output by the at least one light source.

17. The apparatus of claim 14, wherein:  
the at least one controller outputs at least one control signal to the at least one  
25 light source to control the radiation output by the at least one light source; and  
the at least one control signal includes at least one pulse width modulated signal.

18. The apparatus of claim 14, wherein:  
the at least one controller outputs at least one control signal to the at least one  
30 light source to control the radiation output by the at least one light source; and  
the at least one control signal includes at least one variable analog signal.

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FIG. 20

19. The apparatus of claim 14, wherein:  
the at least one LED includes at least a first LED and a second LED, the first and second LEDs having different colors; and  
the at least one controller is adapted to control a first intensity of the first LED  
5 and a second intensity of the second LED.
20. The apparatus of claim 14, further comprising at least one storage device, coupled to the at least one controller, to store at least one illumination program, wherein the at least one controller is adapted to execute the at least one illumination  
10 program so as to control the radiation output by the at least one light source.
21. The apparatus of claim 14, wherein the at least one light source includes at least a first light source and a second light source, wherein the at least one controller includes at least a first controller coupled to the first light source and a second  
15 controller coupled to the second light source, and wherein:  
each of the first controller and the second controller is adapted to be independently addressable; and  
the first controller and the second controller are coupled together to form a networked lighting system.
22. An apparatus, comprising:  
one of a pool and a spa to contain a liquid;  
at least one housing supported by the one of the pool and the spa; and  
at least two independently controllable light sources, disposed in a single housing  
25 of the at least one housing, to illuminate the liquid.
23. An apparatus, comprising:  
one of a pool and a spa to contain a liquid; and  
at least one light source, supported by the one of the pool and the spa, to  
30 illuminate the liquid, wherein the at least one light source is adapted to generate radiation of different colors without requiring the use of a color filter.

24. An apparatus, comprising:  
one of a pool and a spa to contain a liquid;  
at least one light source supported by the one of the pool and the spa to illuminate  
the liquid; and  
5 at least one microprocessor-based controller, coupled to the at least one light  
source, to control radiation output by the at least one light source.

25. An apparatus, comprising:  
one of a pool and a spa to contain a liquid;  
10 at least one light source supported by the one of the pool and the spa to illuminate  
the liquid;  
at least one controller coupled to the at least one light source to control radiation  
output by the at least one light source; and  
at least one storage device, coupled to the at least one controller, to store at least  
15 one illumination program,  
wherein the at least one controller is adapted to execute the at least one  
illumination program so as to control the radiation output by the at least one light source.

26. An apparatus, comprising:  
20 one of a pool and a spa to contain a liquid; and  
a networked lighting system coupled to the one of the pool and the spa to  
illuminate the liquid, the networked lighting system comprising:  
a first independently controllable light source supported by the one of the pool  
and the spa;  
25 a first independently addressable controller coupled to the first independently  
controllable light source;  
at least one other independently controllable light source supported by the one of  
the pool and the spa; and  
at least one other independently addressable controller coupled to the at least one  
30 other independently controllable light source and the first independently addressable  
controller.

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FIGURE 1

27. A method for illuminating a liquid, comprising an act of illuminating the liquid with radiation output simultaneously by at least two differently colored LEDs.

28. A method for illuminating a liquid in one of a pool and a spa, comprising an act of illuminating the liquid in one of the pool and the spa with radiation output by at least one LED.

29. A method for illuminating a liquid in one of a pool and a spa, comprising an act of illuminating the liquid with radiation output by at least two independently controllable light sources disposed together in a housing coupled to the one of the pool and the spa.

30. A method for illuminating a liquid, comprising an act of illuminating the liquid with radiation output by at least one light source, wherein the at least one light source is adapted to generate radiation of different colors without requiring the use of a color filter.

31. A method for illuminating a liquid, comprising an act of illuminating the liquid with radiation output by at least one microprocessor-controlled light source.

32. A method for illuminating a liquid, comprising an act of executing at least one illumination program to control radiation output by at least one microprocessor-controlled light source that illuminates the liquid.

33. A method for illuminating a liquid, comprising an act of illuminating the liquid with radiation output by at least two independently addressable light sources coupled together to form a networked lighting system.

34. An apparatus, comprising:  
at least one light source adapted to be supported by one of a pool and a spa so as to illuminate with variable color radiation a liquid contained in the one of the pool and the spa; and

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at least one controller, coupled to the at least one light source, to control at least one other device associated with the one of the pool and the spa based on the variable color radiation.

5 35. The apparatus of claim 34, wherein the at least one other device includes at least one accessory to operate the one of the pool and the spa, and wherein the at least one controller is adapted to control the at least one accessory based on the generation of a particular color of the variable color radiation.

10 36. The apparatus of claim 35, wherein the at least one accessory includes at least one blower to agitate the liquid contained in the one of the pool and the spa, and wherein the at least one controller is adapted to control the at least one blower based on the generation of a particular color of the variable color radiation.

15 37. The apparatus of claim 35, wherein the at least one accessory includes at least one heater to heat the liquid contained in the one of the pool and the spa, and wherein the at least one controller is adapted to control the at least one heater based on the generation of a particular color of the variable color radiation.

20 38. A method, comprising acts of:  
a) illuminating a liquid contained in at least one of a pool and a spa with variable color radiation; and  
b) controlling at least one device associated with the one of the pool and the spa based on the variable color radiation.

25 39. The method of claim 38, wherein the at least one device includes at least one accessory to operate the one of the pool and the spa, and wherein the act b) comprises an act of:

30 b) controlling the at least one accessory based on the generation of a particular color of the variable color radiation.

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40. The method of claim 39, wherein the at least one accessory includes at least one blower to agitate the liquid contained in the one of the pool and the spa, and wherein the act b1) comprises an act of:

controlling the at least one blower based on the generation of a particular color of the variable color radiation.

41. The method of claim 39, wherein the at least one accessory includes at least one heater to heat the liquid contained in the one of the pool and the spa, and wherein the act b1) comprises an act of:

controlling the at least one heater based on the generation of a particular color of the variable color radiation.

42. In a variable color illumination system capable of generating radiation having at least one hue in a non-liquid medium, the at least one hue including at least a first amount of red and a second amount of one other color in combination, a method for generating at least one liquid hue to illuminate a liquid, the at least one liquid hue, when viewed in the liquid, approximating the at least one hue in the non-liquid medium, the method comprising an act of:

including a third amount of red in the at least one liquid hue, the third amount of red being greater than the first amount of red included in the at least one hue.

43. A method for generating at least one dynamic variable color illumination effect to illuminate a liquid, comprising an act of:

omitting a red color from the at least one dynamic variable color illumination effect.

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FIG. 20 is a schematic diagram of a variable color illumination system.